

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION**

GARY MEDNICK, individually and on behalf of all others similarly situated,)	
)	Case No. 1:14-cv-03624
Plaintiff,)	CONSOLIDATED ACTION
)	
v.)	
)	Hon. Harry D. Leinenweber
PRECOR INC., a Delaware corporation,)	
)	Magistrate Judge Daniel G. Martin
Defendant.)	
STEVEN BAYER, individually and on behalf of all others similarly situated,)	
)	
Plaintiff,)	
)	
v.)	
)	
PRECOR INC., a Delaware corporation,)	
)	
Defendant.)	

**PLAINTIFFS' OPPOSITION TO DEFENDANT'S DAUBERT MOTION TO STRIKE
AND EXCLUDE OPINIONS OF PLAINTIFFS' EXPERT**

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INTRODUCTORY STATEMENT

Plaintiff's expert, Dr. Craig S. Henriquez, is a professor of biomedical engineering of nearly 30 years who currently teaches at Duke University. Relying almost entirely on a snippet from just one case, Precor demands that the Court prevent the jury from hearing his testimony. The only basis for Precor's argument is its dissatisfaction with the extent to which Dr. Henriquez tested the heart rate monitoring system on Precor's defective exercise machines.

But Dr. Henriquez was not retained to design and perform a comprehensive study of subjects using Precor's heart rate monitoring systems. This is because such a study is unnecessary given what has already been studied and is already known in the scientific community concerning the principle of motion artifact. Plaintiffs retained Dr. Henriquez to assist the finder of fact in understanding this well-recognized principle and the relevant scientific literature explaining it. He conducted testing on one subject for purposes of illustration only – to demonstrate the effect of an already well-known and well-accepted phenomenon.

Even a cursory reading of the report confirms that Dr. Henriquez does not premise his expert opinion on the results of this illustrative testing. Rather, his opinion soundly relies on extensive references to published literature, Precor's own documents and materials provided for his review, his experience, his specialized knowledge and academic training, and his observations and research. Precor does not even attempt to quarrel with those authorities or any of the support for the professor's opinion other than the testing. Since an expert may properly opine based on the appropriate literature and his own experience and expertise *without any testing at all*, Precor's narrow attack on Dr. Henriquez's testing does not justify excluding his testimony.

In its misguided effort to defeat class certification, Precor itself concedes that, for multiple reasons, the machines do not accurately measure user heart rates in virtually every case. And Precor's own expert, Michael Garrett, who performed more extensive testing than Dr. Henriquez, acknowledges that motion artifact exists, affects all of Precor's fitness machines, *and can never be eliminated.* In light of all that, and especially because Precor's own testing is consistent with his opinions, Dr. Henriquez had no need to do any of his own testing.

For all those reasons, Precor's motion to exclude Dr. Henriquez should be denied.

COUNTERSTATEMENT OF FACTS

I. Dr. Henriquez's Exemplary Credentials and the Purpose of Retention

Dr. Henriquez is the James L. and Elizabeth M. Vincent Professor of Biomedical Engineering at Duke University. *See* Henriquez Report, Ex. 3 to Plaintiff's Memorandum in Support of Motion for Class Cert., at 1. According to his *curriculum vitae* attached to his Report, Dr. Henriquez has been a professor of bioengineering at Duke or a visiting professor at two other universities for nearly thirty years. He has had 85 peer-reviewed publications and approximately that same number of other publications as well. Defendant makes no effort to challenge Dr. Henriquez's sterling credentials or the professor's qualifications to render his report.

Plaintiffs retained Dr. Henriquez to explain to the finder of fact the general principle of motion artifact, which is well-recognized in the relevant literature. *See* Henriquez Deposition, Ex. A to Plaintiff's Reply Memorandum In Support of Class Cert., at 10:1-9 ("I was asked to review the literature related to the technology involved in hand sensor recording of the heart rate in treadmills. I was asked to review documents that were provided by Precor, and ultimately

asked to examine some of the Precor treadmill technologies.”). His report is thus based on, and studded with citations to, that literature.

Dr. Henriquez’s report cites sixteen references, ranging from longstanding sources to one reference that was “to appear.” Henriquez Report at 17-18. He also reviewed many other references “to help inform [himself],” though those references did not form a basis for his opinions. Henriquez Dep. at 91:9-93:4. He unquestionably had a complete awareness of the relevant literature. Again, *Precor does not attempt to attack Dr. Henriquez’s grasp of the literature or his use of it.*

As Dr. Henriquez stated, “[t]he human body produces electrical currents that allow measurement and detection of the heart rate by electrodes touching the skin surface.” Henriquez Report, at 1. “Motion artifact” is “noise” that “can disrupt the measurement of this electrical activity and result in a miscalculated heart rate.” *Id.*

Precor’s exercise machines purport to measure a user’s heart rate through the Touch Sensors. *Id.* The literature has shown that such sensors are inherently susceptible to motion artifact “due to a number of factors.” *Id.* at 1-2. In fact, with respect to these sensors, “scientific literature prior to 2008 found that motion artifact noise at high intensities or with large upper body movements reduces the accuracy of the heart rate measurement to the point of unreliability.” *Id.* at 1 (citing sources). Dr. Henriquez elaborated on the way the human heart beats, its generation of electrical currents, and “the inherent unreliability of these metal handgrip sensors” in measuring heart rates, *id.* at 2, on pages 3-13 of his report, citing numerous sources. Ultimately, he concluded that “it is apparent that exercise equipment like the tested Precor products, which rely on metal handgrip sensors, provide inherently unreliable heart rate data” due to motion artifact noise and physiological differences among the user population. *Id.* at 3.

II. Dr. Henriquez's Opinions are Consistent with Garrett's Testing

Defendant's own expert, Michael Garrett, recognized the existence of motion artifact and that *motion artifact affects the heart rate function of every one of Precor's machines.* Garrett Report, Exhibit 2 to Precor's Memo. in Opposition to Plaintiffs' Motion for Class Cert., at 10-13. Mr. Garrett performed much testing, which confirmed that the machines are ***notoriously inaccurate.*** *Id.* at 43-49.

First, the ***only*** thing the testing purports to show is whether the subject's heart rate as measured by the Touch Sensors was within 10% of the reading measured by a chest strap. But chest strap readings themselves are not infallible, with Mr. Garrett going so far as to say that they are no more reliable than the readings from the handheld monitors. *See* Garrett Deposition, Exhibit B to Plaintiffs' Reply Memorandum in Support of Class Certification, at 83:7-21.

Even assuming, *arguendo*, that the chest strap number was not itself an estimate but was in fact the actual heart rate, Mr. Garrett's testing confirms the failure of the Precor machines to deliver accurate results. Specifically, as to the 9.23 treadmill, the same model that Plaintiffs Steven Bayer and Gary Mednick own, Mr. Garrett's testing revealed a ***61.9% failure rate at 6 miles per hour*** (13 out of 21 subjects saw results that diverged more than 10% from the chest strap reading) and a ***28.7% failure rate at 4 miles per hour*** (6 out of 21 of subjects had more than 10% deviation). *Id.* at 49 (chart). For Precor's 9.33 treadmill, Mr. Garrett's testing revealed a ***62.5% failure rate at 6 miles per hour*** (10 out of 16 subjects saw readouts that diverged more than 10% from the chest strap) ***and a 12.5% failure rate at 4 miles per hour*** (2 out of 16 subjects saw such divergent results). *Id.* Those results correlated with Dr. Henriquez's

conclusion, quoted above, regarding the “inherent unreliability” of Defendant’s treadmills at speeds above 4 miles per hour.

As to the remaining subjects that Mr. Garrett tested on both treadmills (except for one subject who moved at 3 miles per hour and saw results that diverged more than 10% from the chest strap reading), and on the elliptical machine and stationary bicycle, he could say only that their heart rates as shown by Defendant’s machines did not deviate by more than 10% from the chest strap reading. *Id.* In addition, for each of the machines except for the Precor 9.33 treadmill, test subjects either exceeded the maximum heart rate *or their heart rate was lost entirely during “high effort” exercise.* *Id.* at 54. For example, on the EFX833 elliptical, 3 out of 14 subjects were excluded due to lost heart rate at “maximum” intensity, *a failure rate of over 20%.* *Id.* at 52.¹ This is by no means conclusive proof that the readings are accurate, or that motion artifact has no bearing on the results.

Accordingly, Dr. Henriquez need not have performed any of his own testing. He could have accepted the results of Mr. Garrett’s testing, which showed frequent extreme deviations in heart rate readouts, and still reached his own opinion that Precor’s machines are affected by motion artifact no matter who uses them, and irrespective of the physical characteristics of those users, based on the literature and his own vast experience and expertise. *See* Henriquez Dep. at 20:17-23 (“The conclusions I came to were based not only on the treadmill testing, but also my review of the literature. The two in combination sort of led to my ultimate conclusions.”). Nonetheless, Dr. Henriquez did perform extensive testing of one subject on several of

¹ Plaintiffs include quotation marks around the words “high effort” and “maximum” because Mr. Garrett’s characterization of his settings as “Minimum Effort,” “Medium Effort,” and “High Effort” is subjective and does not accurately reflect the experience of a Precor user. *See id.* at 46. For example, Mr. Garrett characterizes a “4.0 mph run” on a treadmill as “High Effort” though he concedes that several subjects were *walking* at that speed. Garrett Deposition at 124:2-125:15. He admitted at deposition that his use of the term “run” was not accurate. *Id.*

Defendant's treadmills (Henriquez Report, Appendix A) for purposes of illustrating his conclusions based on his own knowledge and his review of the literature.

III. Differences in the Internal Circuitry of Precor's Machines to Do Not Affect Dr. Henriquez's Opinions Concerning Motion Artifact

Precor makes much of the supposed differences among the bodies of circuitry, and the manufacturers of that circuitry, that are contained in some of its exercise machines. But when challenged about those alleged differences at his deposition, Dr. Henriquez testified that “[f]or [his] purposes it wasn't important to know” which manufacturer's circuitry was present in which machines.” Henriquez Dep. at 12:24-13:11. His “intent was not to run a full exhaustive analysis of the circuitry in the system, it was to understand the basis for any potential miscalculation or misrepresentation of the heart rate which didn't necessarily rely on understanding what was happening in between the sensor and the display.” *Id.* at 79:3-9.

Different sources of circuit boards “would not be important to [him] in understanding how the technology works,” because Dr. Henriquez was focused on “the basis of motion artifact and how that would be transformed into a heart rate estimate that's provided to the user,” not “what they were doing inside the machine.” *Id.* at 13:20-14:18. This case, and Dr. Henriquez's report and testimony, involves “what the output was from the machines,” *id.* at 14:18-19, that is, what users of the machines saw reported as their heart rates. Whether Precor's exercise equipment has different internal circuitry does not change the fact Precor's Touch Sensor heart rate monitors all suffer from the same defect—the inability to accurately account for uncompensated motion artifact. Because human motion is unpredictable, all Precor fitness machines equipped with Touch Sensors inaccurately record heart rate, irrespective of the internal circuitry.

To the extent that different machines used different algorithms to produce their heart rate readouts, Dr. Henriquez studied how different algorithms “would affect the output” that users of the machines would see. *Id.* at 14:25-16:13. He determined that different algorithms would produce different outputs for the same user. *Id.* at 17:18-18:14. That result was in line with his overall conclusion that Defendant’s machines produce inconsistent and inaccurate heart rate readings, contrary to what Defendant represents to the consumer.

Similarly, Dr. Henriquez testified that, although he had tested only treadmills, his conclusion as to other equipment sold by Defendant, such as elliptical machines or stationary bicycles would be the same as for treadmills. “The motions [of the user of such other equipment] would be different, but I believe that motion [artifact] would still be a factor in all of those devices.” *Id.* at 21:3-17. Again, his opinion in this regard was supported by “data from other sources regarding the elliptical,” *id.* at 22:19-21, studies that Dr. Henriquez cited in his report, and his overall “understanding of motion artifact” as applicable to stationary bicycles, which derives from his “review of the literature and the current state of the art with regard to motion artifact compensation, *id.* at 23:24-27:7.

Defendant mistakenly considers the issues that are the subject of Dr. Henriquez’s opinion to be ones that require testing. At his deposition, however, the professor said that was not so. He noted, for example, that one such issue highlighted by Defendant was in fact a “theoretical question,” which he would answer by thinking the issue through and “do[ing] a theoretical study of this effect. I wouldn’t have to test lots of people. That’s not where I would start.” *Id.* at 51:5-52:23. Dr. Henriquez’s view of the proper methodology for analysis of such issues stands uncontradicted in the record.

ARGUMENT

I. Dr. Henriquez Is Admissible

Proceeding from Federal Rule of Evidence 702, which governs expert testimony, the Seventh Circuit has created “a three-part inquiry. Expert testimony is admissible if (1) the expert is qualified, (2) the expert’s reasoning or methodology is reliable, and (3) the expert’s testimony will assist the trier of fact.” *Midwest Fence Corp. v. United States DOT*, 84 F. Supp. 3d 705, 723-24 (N.D. Ill. 2015).

Precor does not challenge Dr. Henriquez’s qualifications, and his testimony indisputably will assist the trier of fact. After all, Defendant too has proffered an expert, Mr. Garrett, on this very same subject. Thus, Defendant’s attack on Dr. Henriquez is based solely on the alleged unreliability of his methodology. That attack fails.

Defendant’s entire basis for challenging the reliability of Dr. Henriquez’s reasoning is the assertion that his testing of only one subject disqualifies him. That argument rests solely on *American Honda Motor Co., Inc. v. Allen*, 600 F.3d 813, 818-19 (7th Cir. 2010) (“a sample size of one is rarely, if ever, sufficient”). But that case, unlike this one, did not involve (a) an expert who had other valid bases for his opinions besides testing; or (b) testing by the opposing expert that confirmed the challenged expert’s own conclusions.

Allen involved an expert, Ezra, whose standard for “wobble decay” in motorcycles was one that he himself had created for use in a mid-1980’s lawsuit and about which he published a journal article in 2004. *Id.* at 817-18. However, “[d]espite its publication, there is no indication that Ezra’s wobble decay standard has been generally accepted by anyone other than Ezra.” *Id.* at 818. Moreover, Ezra’s expert report “merely deemed ‘reasonable’ his proposed standard, relying solely on his own previous (and similarly unsupported) assessment of the same for

support.” *Id.* Thus, even without addressing Ezra’s testing or lack thereof, his opinion would have been excluded because the “‘principles and methodology’ underlying his findings … [were] questionable at best.” *Id.* (citation omitted).

Allen thus bears no resemblance at all to the present case. Dr. Henriquez’s report relies on a large body of literature, which he carefully and extensively cited. In no way are his conclusions about the existence of motion artifact and its effect on exercise machines merely the product of his own invention and unsupported by anyone else in the field, as was the case in *Allen*. Indeed, as discussed above, Precor’s expert, Mr. Garrett, agreed that motion artifact exists, that it affects heart rate results as a general matter, and that it in fact did so in Mr. Garrett’s own testing of Defendant’s machines.

As another judge in this District ruled in a case that also involved a bioengineering expert, “[a]n expert is not always required to personally perceive the subject of his analysis.” *Traharne v. Wayne/Scott Fetzer Co.*, 156 F. Supp. 2d 697, 708 (N.D. Ill. 2001). That case involved claims of negligent manufacture and wrongful design of a submersible pump that caused the death by electrocution of plaintiff’s decedent. The defendant in *Traharne* sought to exclude the plaintiff’s expert, Dr. Morse, because he had not inspected or tested the sump pump or the short-circuited extension cord involved in the decedent’s accident, or reviewed photographs of the sump pump. *Id.* at 708 (quoting defendant’s brief as arguing that Dr. Morse reached a conclusion “without any scientific analysis [or testing]”) (bracketed material in original). Dr. Morse did, however, examine an exemplar sump pump, but one that differed in certain ways from the pump at issue. *Id.*

The court denied (except in respects not relevant here) the motion to exclude Dr. Morse. Dr. Morse’s “opinion in this regard is based on the documents and materials given to him, his

experience, and his specialized knowledge, all backed by his academic training and his observations and research in connection with his consultation services in other state and federal litigation involving electrical injury issues. As such it is not speculative. It is based on his expertise.” *Id.* at 709. Like Dr. Henriquez here, Dr. Morse testified that it was not reasonable or necessary to do the testing that the defendant demanded, and the court accepted that testimony. *Id.* at 711. The defendant was free to cross-examine Dr. Morse about supposed deficiencies in his analysis, *id.* at 709, and his choice not to do the testing that defendant claimed was essential, *id.* at 711.

Courts within the Seventh Circuit have likewise rejected attempts to exclude experts because they did not test or measure the products at issue. *E.g., Ballard v. Zimmer, Inc.*, No. 11 C 6786, 2015 U.S. Dist. LEXIS 115632, at *2, 10-11, 24-25 (N.D. Ill. Aug. 13, 2015) (denying motion to exclude expert in defective hip replacement case who had not measured implanted Head and Stem whose interaction allegedly caused injury; that and other objections went only to weight of expert’s opinion, which could be explored on cross-examination); *Dartey v. Ford Motor Co.*, 104 F. Supp. 2d 1017, 1026 (N.D. Ind. 2000) (expert had not tested TPE plastic at issue, but that (and other attacks on him) were for the jury to consider, along with cross-examination).

Finally, “[t]he mere fact that [Dr. Henriquez] failed to consider some variables (that [defendant] wishes he did) is not sufficient to find his methods unreliable under *Daubert* [*v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993)].” *United States ex rel. Tyson v. Amerigroup Ill., Inc.*, 488 F. Supp. 2d 719, 733 (N.D. Ill. 2007). Dr. Henriquez testified that he knew what he needed to know about any differences in the machines’ algorithms and in users’ movements, on treadmills or on other machines, and his opinions were amply supported by the

literature and, indeed, by Mr. Garrett's testing. Defendant can attempt to cross-examine Dr. Henriquez at trial about those alleged variables, but there is no basis to exclude him.

CONCLUSION

For these reasons, Precor's motion to exclude Dr. Henriquez should be denied.

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Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned, an attorney, hereby certifies that a true and correct copy of the foregoing was filed this 7th day of March, 2016, via the electronic filing system of the United States District Court for the Northern District of Illinois, which will automatically serve all counsel of record.

/s/ Katrina Carroll
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